

REMARKS

I. Status of Claims

Claims 1-11 are pending in the application. Claims 1 and 7 are independent. Claim 1 is amended.

Claims 1, 2, 5, 7 and 8 stand rejected under 35 USC 102(b) as allegedly being anticipated by Hasegawa (USP 5,460,138) (hereinafter “Hasegawa”).

Claims 6 and 11 stand rejected under 35 USC 103(a) as allegedly being unpatentable over Hasegawa in view of Kani et al (USP 5,114,769).

Claims 3, 4, 9 and 10 stand rejected under 35 USC 103(a) as allegedly being unpatentable over Hasegawa in view of Kristiansson (USP 5,323,743).

The Applicant respectfully requests reconsideration of these rejections in view of the following remarks and the foregoing amendments.

II. Pending Claims

Claims 1 and 7, the only independent claims, stand rejected under 35 USC 102(b) as allegedly being unpatentable over Hasegawa.

The Applicant respectfully submits that claim 1 is patentable over Hasegawa at least because it recites, “a reverse rotation presumption module that presumes reverse rotation of the internal combustion engine based on the measured revolution speed of the internal combustion engine...” and “a cranking control module that prohibits cranking of the internal combustion engine regardless of fulfillment of an auto start condition, when said reverse rotation presumption module presumes the reverse rotation of the internal combustion engine.” (emphasis added)

The Applicant respectfully submits that claim 7 is patentable over Hasegawa at least because it recites, “a reverse rotation presumption module that presumes reverse rotation of the internal combustion engine ...” and “a cranking control module that prohibits cranking of the internal combustion engine regardless of fulfillment of an auto start condition, when said reverse rotation presumption module presumes the reverse rotation of the internal combustion engine.”

Certain embodiments of the present application regard a modified engine start control routine (See FIG. 4) that does not actuate the starter motor to crank the engine even when the preset starting conditions are fulfilled under presumption of the reverse rotation of the engine based on the measured revolution speed of the internal combustion engine. Such presumption is given until a predetermined time period (tref) has elapsed. Moreover, this engine start control routine immediately cranks the engine when the preset starting conditions are met while the revolution speed (Ne) of the engine is not less than the preset level (Neref), that is, while the engine still continues rotating by the inertial force after the start of the engine stop operations. Thus, the engine can be quickly started. In addition, this arrangement can be desirable to prevent excess stress from acting on the rotating shaft of the starter motor and the gear mechanism. Consequently, this arrangement can effectively limit potential damage to the rotating shaft and the gear mechanism.

In contrast to the present application, Hasegawa neither discloses nor suggests a reverse rotation presumption module that presumes reverse rotation of the internal combustion engine based on the measured revolution speed of the internal combustion engine and a cranking control module that prohibits cranking of the internal combustion engine regardless of fulfillment of an auto start condition, when said reverse rotation presumption module presumes the reverse rotation of the internal combustion engine. Rather, Hasegawa discloses a starting motor system, which includes a starting motor, and a barring system for rotating an engine crankshaft that is different than at least the embodiments claimed in the present invention.

For example, the barring system of Hasegawa does not “presume reverse rotation of the internal combustion engine based on the measured revolution speed of the internal combustion engine” as required by Applicant’s claims 1. Instead, the barring system is operated to observe and advance/reverse the flywheel and crankshaft for maintenance or repair procedures, but does not presume reverse rotation (or any rotation).

Further, the cranking control module of Hasegawa does not prohibit cranking of the internal combustion engine (e.g., crankshaft and flywheel) regardless of fulfillment of an auto start condition, when said reverse rotation presumption module presumes the reverse rotation of the internal combustion engine. Rather, the cranking module of Hasegawa cited in the Office Action prevents actuation of the starter motor 22, but not the internal combustion engine, since the crankshaft and flywheel can still be rotated. Otherwise, the barring system would not be able

to perform its intended function of rotating these components during maintenance and repair.

Lacking any teaching and/or suggestion of Applicant's reverse rotation presumption and cranking control modules, Hasegawa does not anticipate Applicant's claims.

In addition, the Applicant respectfully submits that the other cited references do not cure the deficiencies of Hasegawa.

The Applicant respectfully submits that for at least these reasons, claims 1 and 7, as well as their dependent claims, are patentable over the cited references.

III. Conclusion

In light of the above discussion, Applicant respectfully submits that the present application is in all aspects in allowable condition, and earnestly solicits favorable reconsideration and early issuance of a Notice of Allowance.

The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application. The Office is authorized to charge any fees related to this communication to Deposit Account No. 11-0600.

Respectfully submitted,

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